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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,500	09/28/2006	Mitsutaka Iwasaki	Q97275	3722
72875	7590	11/06/2007		
SUGHRUE MION, PLLC 2100 Pennsylvania Avenue, N.W. Washington, DC 20037			EXAMINER HSIEH, SHIH WEN	
			ART UNIT	PAPER NUMBER
			2861	
			NOTIFICATION DATE	DELIVERY MODE
			11/06/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/594,500	Applicant(s) IWASAKI, MITSUTAKA	
	Examiner shih-wen hsieh	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7-9, 14, 16 and 20 is/are rejected.
- 7) ☒ Claim(s) 4, 6, 10-13, 15 and 17-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9-28-06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PCT/JP05/00405, filed on Jan. 14, 2005.

A Xeroxed copy of the priority document has been received by this office.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (US Pat. No. 6,036,299).

In regard to:

Claim 1:

Kobayashi et al. teach in their fig. 5:

A method for cleaning a liquid ejector including a liquid ejection head for ejecting liquid from a nozzle, the method comprising:

sealing the liquid ejection head (7 or 8, fig. 2) with a cap device (12 or 13, fig. 2),
refer to col. 6, lines 48-50;

generating negative pressure with a gear pump connected to the cap device, and
discharging fluid from the liquid ejection head with the negative pressure, refer to step
S127, and col. 6, line 57 to col. 7, line 5;

suctioning fluid from the cap means device with the gear pump so that a suction
amount of the fluid per unit time becomes equal to a first suction amount in order to
discharge fluid from the nozzle, refer to step S127, and col. 6, line 57 to col. 7, line 5;
and

continuously following said suctioning, suctioning fluid from the cap device by
changing the suction amount of the fluid per unit time from the first suction amount to a
smaller second suction amount, refer to step S132, and col. 9, lines 42-59.

The device of Kobayashi et al. **DIFFERS** from claim 1 in that it does not teach:
the suction pump is a gear pump.

To this issue, Kobayashi et al. teach in their col. 11, lines 1+ that "in a case the
suction pumps 14 and 15 are formed by the tube suction pumps...". Or, Kobayashi et
al. simply gave an example of a type of suction pump such as a tube pump, which can
be used as the suction pump of their invention.

It is well known to one skilled in the art that suction pumps mostly used in ink jet
printer are: (1) tube pump or peristaltic pump (2) piston pump and (3) gear pump, refer
to MPEP 2144.03, In re Malcolm, 129 F.2d 529, 54 USPQ 235 (CCPA 1942).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to include a gear pump as a suction pump, because a gear pump is also often used in ink jet printer field, and is equivalent to a tube pump as far as the suction function is concerned.

Claim 2:

A liquid ejector comprising:

a liquid ejection head including a nozzle for ejecting a liquid;

a cap device for sealing the liquid ejection head;

a gear pump, connected to the cap device, for generating negative pressure and discharging fluid out of the liquid ejection head with the negative pressure in a state in which the cap device seals the liquid ejection head, wherein the liquid ejector:

suctions fluid from the cap device with the gear pump so that a suction amount of the fluid per unit time becomes equal to a first suction amount in order to discharge fluid from the nozzle; and

continuously afterwards, suction fluid from the cap means device by changing the suction amount of the fluid per unit time from the first suction amount to a smaller second suction amount.

Rejection:

This claim is rejected on the basis as set forth for claim 1 discussed above.

Claim 3:

The liquid ejector according to claim 2, wherein the gear pump is driven so that the suction amount per unit time becomes equal to the first suction amount in order to

discharge fluid from the nozzle, and continuously afterwards, is driven so that the suction amount per unit time becomes equal to the second suction amount per unit time, and then stops.

Rejection:

This claim is rejected on the basis as set forth for claims 1 and 2 discussed above. As shown in Kobayashi et al.'s fig. 4, after steps S127 and S132, the suction operation stops (or steps in the flow diagram shown in fig. 5 are operations other than these two suction operations).

Claim 5:

The liquid ejector according to 2, wherein the gear pump includes a housing and two gears accommodated in the housing.

Rejection:

Any pump has to have a housing, and a gear pump has to have at least two gears so as to build up the suction function during their rotation with meshing with each other, refer to MPEP 2144.03, In re Malcolm, 129 F.2d 529, 54 USPQ 235 (CCPA 1942).

Claim 8:

A method for cleaning a liquid ejector including a liquid ejection head for ejecting liquid from a nozzle, the method comprising:

sealing the liquid ejection head with a cap device;

generating negative pressure with a gear pump connected to the cap device and suctioning fluid from the cap device in a first suction amount per unit time with the negative pressure;

determining whether or not fluid has been discharged from the nozzle; and

changing the suction amount per unit time from the first suction amount to a smaller second suction amount when determining that fluid has been discharged from the nozzle.

Rejection:

This claim is rejected on the basis as set forth for claims 1 and 2 discussed above. For the determining step, please refer to col. 7, lines 23-33.

Claim 9:

The liquid ejector according to claim 3, wherein the gear pump includes a housing and two gears accommodated in the housing.

Rejection:

This claim is rejected on the basis as set forth for claim 5 discussed above.

4. Claims 7, 14, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. in view of Usui et al. (US Pat. No. 6,302,531).

In regard to:

Claim 7:

The device of Kobayashi et al. **DIFFERS** from claim 7 in that it does not teach:
a flow passage for guiding liquid to the nozzle; and

a valve device arranged upstream from the nozzle in the flow passage;
wherein the valve device includes a pressure chamber(11), for storing liquid, and a flexible member, displaced in accordance with a pressure difference between an interior and exterior of the pressure chamber, and the valve device opens and closes based on the displacement of the flexible member.

Usui et al. teach in their fig. 14 an ink jet recording head (500) having an integral ink tank (600), which supplies ink to the recording head. The recording head also has a valve unit (40), which is a diaphragm valve (6). The diaphragm valve has a flexible diaphragm (6), which when subject to pressure change will open/close openings (9), refer to col. 6, lines 9-27.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to include the recording head with its integral ink tank, and the valve unit disposed in between the ink supply channel (P) and the ink tank as taught by Usui et al. for the purpose of supplying ink to the nozzles of the recording head, and the valve unit will regulate the ink flow.

Claim 14:

The liquid ejector according to claim 3, further comprising:

a flow passage for guiding liquid to the nozzle; and a

valve device arranged upstream from the nozzle in the flow passage;

wherein the valve device includes a pressure chamber, for storing liquid, and a flexible member, displaced in accordance with a pressure difference between an interior

and exterior of the pressure chamber, and the valve device opens and closes based on the displacement of the flexible member.

Rejection:

This claim is rejected on the basis as set forth for claim 7 discussed above.

Claim 16:

The liquid ejector according to claim 5, further comprising:

a flow passage for guiding liquid to the nozzle; and

a valve device arranged upstream from the nozzle in the flow passage;

wherein the valve device includes a pressure chamber, for storing liquid, and a flexible member, displaced in accordance with a pressure difference between an interior and exterior of the pressure chamber, and the valve device opens and closes based on the displacement of the flexible member.

Rejection:

This claim is rejected on the basis as set forth for claim 7 discussed above.

Claim 20:

The liquid ejector according to 9, further comprising:

a flow passage for guiding liquid to the nozzle; and

a valve device arranged upstream from the nozzle in the flow passage;

wherein the valve device includes a pressure chamber, for storing liquid, and a flexible member, displaced in accordance with a pressure difference between an interior and exterior of the pressure chamber, and the valve device opens and closes based on the displacement of the flexible member.

Rejection:

This claim is rejected on the basis as set forth for claim 7 discussed above.

Allowable Subject Matter

5. Claims 4, 6, 10-13, 15 and 17-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for the allowance of claims 4, 10, 12, 15 and 19 is the inclusion of the limitation of wherein the gear pump is driven at a first rotation speed so that the fluid in the cap device is suctioned in the first suction amount, and continuously afterwards, driven at a second rotation speed, which is lower than the first rotation speed, so that the fluid in the cap device is suctioned in the second suction amount. It is this limitation found in each of the claims as they are claimed in the combination, which has not been found, taught or suggested by the prior art of record that makes these claims allowable over the prior art.

Claims 6, 11, 13, 17 and 18:

The primary reason for the allowance of claims 6, 11, 13, 17 and 18 is the inclusion of the limitation of a detector for detecting an increase and decrease in load of

the gear pump caused by a flow of fluid into the gear pump and a flow of fluid out of the gear pump; wherein the gear pump changes the suction amount per unit time from the first suction amount to the second suction amount after detector detects an increase in the load of the gear pump. It is this limitation found in each of the claims as they are claimed in the combination, which has not been found, taught or suggested by the prior art of record that makes these claims allowable over the prior art.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to shih-wen hsieh whose telephone number is 571-272-2256. The examiner can normally be reached on 9/5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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SWH



Oct. 24, 2007

SHIH-WEN HSIEH
PRIMARY EXAMINER

